(Bulletins 305 to 309 constitute the Report for 1922. In binding, pages i-x at the end of this buleltin should be detached and placed before Bulletin 305 which begins with page 1.)

Maine Agricultural Experiment Station

ORONO

BULLETIN 309 **DECEMBER, 1922**

ABSTRACTS OF PAPERS NOT INCLUDED IN BULLETINS, FINANCES, METEOROLOGY, INDEX.

CONTENTS

MAINE
AGRICULTURAL EXPERIMENT STATION
ORONO, MAINE

THE STATION COUNCIL

PRESIDENT CLARENCE C. LITTLE,	*President*
DIRECTOR WARNER J. MORSE,	*Secretary*
ORA GILPATRICK, Houlton,	*Committee of Board of Trustees*
THOMAS E. HOUGHTON, Fort Fairfield,	*Committee of Board of Trustees*
FRANK E. GUERNSEY, Dover,	*Committee of Board of Trustees*
FRANK P. WASHBURN, Augusta,	*Commissioner of Agriculture*
EUGENE H. LIBBY, Auburn,	*State Grange*
WILSON H. CONANT, Buckfield,	*State Pomological Society*
JOHN W. LELAND, Dover,	*State Dairymen's Association*
LEONARD C. HOLSTON, Cornish,	*Maine Livestock Breeders' Ass'n.*
WILLIAM G. HUNTON, Portland,	*Maine Seed Improvement Ass'n.*

And the Heads and Associates of Station Departments, and the Dean of the College of Agriculture

THE STATION STAFF

ADMINISTRATION	WARNER J. MORSE, Ph. D.,	*Director*
	CHARLES C. INMAN,	*Clerk*
	MARY L. NORTON,	*Clerk*
	ILA K. WHITE,	*Clerk*
BIOLOGY	JOHN W. GOWEN, Ph. D.,	*Biologist*
	KARL SAX, Sc. D.,	*Biologist*
	MARJORIE GOOCH, M. S.,	*Assistant*
	MILDRED R. COVELL,	*Clerk*
	BEATRICE WEBSTER,	*Laboratory Assistant*
CHEMISTRY	JAMES M. BARTLETT, M. S.,	*Chemist*
	ELMER R. TOBEY, Ch. E.,	*Associate*
	C. HARRY WHITE, Ph. C.,	*Assistant*
ENTOMOLOGY	EDITH M. PATCH, Ph. D.,	*Entomologist*
	ALICE W. AVERILL,	*Laboratory Assistant*
PLANT PATHOLOGY	WARNER J. MORSE, Ph. D.,	*Pathologist*
	DONALD FOLSOM, Ph. D.,	*Associate*
	VIOLA L. MORRIS,	*Laboratory Assistant*
AROOSTOOK FARM	.....	*Associate Biologist*
	PERLEY H. DOWNING,	*Superintendent*
HIGHMOOR FARM	.....	*Scientific Aid*
	WELLINGTON SINCLAIR,	*Superintendent*

ABSTRACTS OF PAPERS PUBLISHED BY THE STATION IN 1922 BUT NOT INCLUDED IN THE BULLETINS.

A complete list of all the publications issued by and from the Station in 1922 is given on page ix of the introduction to this Report. The following pages contain abstracts of the papers issued during the year that are not included in the Bulletins or Official Inspections for the year.

STERILITY IN WHEAT HYBRIDS.

II. Chromosome Behavior in Partially Sterile Hybrids.*

The chromosome number and behavior has been determined for the cultural species of Triticum and for certain partially sterile hybrids.

The gametic chromosome number is 7 for *T. monococcum;* 14 for the Emmer group, consisting of *T. dicoccum, T. durum, T. polonicum,* and *T. turgidum;* and 21 for the Vulgare group, consisting of *T. vulgare, T. compactum* and *T. Spelta.* Rye *(Secale cereale)* has 7 gametic chromosomes.

In the F_1 hybrid of *T. monococcum* x *T. turgidum* 7 chromosomes are contributed by one parent and 14 by the other parent. In the heterotypic division of the pollen mother cells there are 7 bivalents and 7 single chromosomes. The 7 bivalents divide normally, but the 7 univalents pass at random to either pole without dividing. In the homoeotypic division there are usually about 10 or 11 chromosomes which apparently divide normally in most cases. Tetrads and one-nucleate pollen grains appear to be normal, but very few normal mature pollen grains are formed.

In F_1 hybrids between members of the Emmer group and members of the Vulgare group, 14 chromosomes are contributed by one parent and 21 by the other parent. In the first meiotic division there are 14 bivalent and 7 univalent chromosomes. The bivalents divide normally, but the univalents do not become oriented on the equatorial plate until the bivalents have divided. The

*This is an abstract of a paper by Karl Sax having the same title and published in Genetics, Vol. 7, pp. 513-552, November, 1922.

7 lagging univalents divide equationally and 7 chromosomes pass to each pole. In the homoetypic division the original members of the bivalents divide normally, but the remaining 7 chromosomes pass at random to either pole without dividing. As a result the chromosome number of the microspores varies from 14 to 21. The tetrads and one-nucleate pollen grains appear to be normal, but in later stages about 20 percent of the pollen grains are obviously imperfect and undoubtedly a larger percentage is non-functional.

The size of the pollen grains is closely correlation with the chromosome number in the various species of wheat.

The pollen grains of fertile species hybrids are more variable than the pollen grains of the parental species, due to various degrees of compatibility of the combinations of non-homologous chromosomes in the gametophtic generation. In partially sterile hybrids where the parental species differ in chromosome number, the pollen grains are extremely variable, due to difference in chromosome number and to more or less compatible chromosome combinations.

The sterility in the hybrids described can be accounted for on a hypothesis involving, (1) the numerical or unbalanced relations of the chromosomes resulting from the irregular meiotic divisions, and (2) the specific interrelations of the parental chromosomes. In the numerical relations the development of gametes varies as the chromosome number approaches the normal gametic number (7, 14 or 21). It is assumed that the greater the gametic chromosome number the greater can be the deviation from the normal number. The specific relations of the gametic chromosomes will depend on the extent that chromosomes from one parent can be substituted for those of the other parent. Gametic perfection will vary as the chromosome constitution approaches that of the parental forms. The 7 univalents in the Emmer-Vulgare F_1 hybrids presumably carry most of the factors which differentiate the Vulgare characters from the Emmer characters.

This hypothesis will explain (1) the differences in sterility of the various species hybrids, (2) the partial association of the original parental characters in the F_2 segregates, (3) the absence of varieties or species with intermediate chromosome numbers, and (4) the difficulty in obtaining homozygous segregates com-

bining the desirable characters of the parental species in partially sterile wheat hybrids.

In all cases the F_1 plants are unusually vigorous and sterility is not due to poor vegetative development, but is caused by the formation of non-functional gametes. Sterility in F_2 segregates may be greater than in F_1 individuals due, not to greater gametic sterility *per se,* but to a combination of weak somatic development and gametic sterility.

There is a high degree of correlation between chromosome numbers and adaptability and economic value of wheat species. The species with 7 chromosomes are of no economic value and are found only in hot, tropical regions. Those with 14 chromosmes are of some economic value though none of these varieties are of value for making light bread. These species are for the most part spring wheats and are not suitable for cold climates. They are mostly from the regions around the Mediterranean. The species of wheat with 21 chromosomes are the ones of greatest economic value and are the only ones containing varieties suitable for the making of light bread. Species of this group are found all over the world where wheat can be grown and diverse regions in regard to climatic conditions. Since there is so high a degree of relationship between economic value and chromosome numbers in the species of wheat it might be of value to try to increase the chromosome numbers by artificial means. This has been done in a limited way in certain other species.

STERILITY IN WHEAT HYBRIDS.

III. ENDOSPERM DEVELOPMENT AND F_2 STERILITY.*

Crosses between strains of wheat which differ in chromosome number result in small, wrinkled grain and more or less sterility in F_1. Since poorly developed F_1 endosperms are associated with sterility and unusual vegetative vigor of the F_1 plant, a high degree of correlation would be expected between F_2 endosperm development and sterility and vegetative development of F_2 plants. An analysis of the data obtained from a cross of Kubanka x Bluestem indicates, however, that there is little or no correlation be-

*This is an abstract from a paper by Karl Sax having the same title and published in Genetics, Vol. 7, pp. 553-558, November, 1922.

tween F_2 endosperm development and F_2 sterility or vegetative development. Apparently the results of the peculiar chromosome relationships in endosperm formation do not indicate the nature of the chromosome relations of the accompanying embryo.

AROOSTOOK POTATO INSECTS.*

Since aphids have been found to transfer potato mosaic and leaf roll (Bulletins 292, 297, and 303, Me. Agr. Exp. Sta.), and certain other insects with piercing and sucking mouthparts are being viewed with suspicion, a list of Hemiptera frequenting potato vines may prove suggestive to persons interested in experimental work with disease transference. The following insects were collected from potato at Presque Isle, Maine in 1921. While certain of them may have been resting on potato vines by chance, most of them were common enough to be taken repeatedly though none, except *Lygus pratensis,* were abundant enough the past season, to assume significant economic importance. *Cosmopepla carnifex, Canthophorus cinctus, Adelphocoris rapidus, Poecilocapsus lineatus, Lygus pratensis, Philaenus spumarius, Philaenus lineatus, Clastoptera proteus, Ceresa basalis, Platymetopius acutus, Acocephalus nervosus (striatus), Phlepsius apertus, Graphocephala coccinea, Agallia sanguinolenta.*

METEOROLOGICAL OBSERVATIONS.

For many years the meteorological apparatus was located in the Experiment Station building and the observations were made by members of the Station Staff. June 1, 1911, the meteorological apparatus was removed to Wingate Hall and the observations are in charge of Dr. James S. Stevens, professor of physics in the University of Maine.

In September, 1914, the meteorological apparatus was moved to Aubert Hall, the present headquarters of the physics department.

The instruments used are at Lat. 44° 54′ 2″ N. Lon. 64° 40′ 5″ W. Elevation 135 feet.

---

*This is an abstract from a paper by Edith M. Patch, having the same title and published in Journ. Econ. Entomology, Vol. 15, p. 373, October, 1922.

The instruments used are the same as those used in preceding years, and include: Maximum and minimum thermometers; rain guage; self-recording anemometer; vane; and barometers. The observations at Orono now form an almost unbroken record of fifty-four years.

METEOROLOGICAL SUMMARY FOR 1922.

Observations Made at the University of Maine.

1922	January	February	March	April	May	June	July	August	September	October	November	December	Average	Total
Highest temperature	32	49	55	67	85	89	85	89	82	78	55	42		
Lowest temperature	-17	-21	-4	23	20	43	48	36	27	19	15	-21		
Mean temperature	12.4	17.9	30.7	40.5	52.55	61.65	65.3	62.5	56.15	46.15	33.65	15.04	41.21	
Mean temperature in 54 years	16.09	14.98	30.29	40.10	51.31	60.86	66.05	65.92	59.44	50.47	37.63	23.79	43.09	
Total precipitation in inches	1.84	2.28	3.33	2.97	1.05	8.66	2.26	5.39	2.10	2.78	2.26	2.26		37.18
Mean total precipitation in 54 years	2.53	3.45	3.92	2.94	3.41	3.45	3.44	2.36	3.37	3.74	3.40	3.35		39.36
Number of days with .01 precipitation or more	5	10	8	9	5	16	7	11	6	12	8	10		107
Snowfall in inches	16.9	29.5	4.0	9.0						.75	.25	28.75		79.25
Mean snowfall in 54 years	21.3	22.05	14.43	5.73	.215					.712	7.09	16.48		
Number of clear days	19	12	13	7	13	5	14	10	16	12	8	10		139
Number of fair days	8	6	12	10	12	16	13	12	11	9	12	8		129
Number of cloudy days	4	10	6	13	6	9	4	9	3	10	10	13		97
Average velocity of wind per hour in miles	5.195	5.129	6.048	6.591	6.673	5.144	4.45	3.809	4.078	5.744	4.587	5.33	5.23	

REPORT OF THE TREASURER.

The Station is a department of the University and its accounts are kept in the office of the Treasurer of the University. The books, voucher files, etc., are, however, all distinct from those of the other departments of the University. The classification of accounts is that prescribed by the auditors on the part of the Federal Government, and approved by the State Auditor. All of the accounts are audited by the State Auditor, and the Hatch Fund and Adams Fund accounts are also audited by the Office of Experiment Stations acting for the United States Secretary of Agriculture in accordance with Federal Law.

The income of the Station from public sources for the year that ended June 30, 1922, was:

U. S. Government, Hatch Fund appropriation	$15,000.00
U. S. Government, Adams Fund appropriation	15,000.00
State of Maine, Animal Husbandry investigation appropriation	5,000.00
State of Maine, Aroostook Farm investigation	5,000.00
State of Maine, Highmoor Farm investigations	5,000.00

The cost of maintaining the laboratories for the inspection analyses is borne by analysis fees and by the State Department of Agriculture. The income from sales at the experiment farms is used for the expense of investigations. The printing is paid for by an appropriation to the University.

At Aroostook Farm there are in connection with the cooperative work with the Federal Department of Agriculture expenditures mostly under "labor" for the Department and for which the Station is reimbursed. There are also certain expenditures for the Department made from sales of crops from Department investigations that do not appear in the tabular statements. They are carried as distinct and separate accounts, always with credit balances, on the Station ledger.

REPORT OF THE TREASURER FOR YEAR ENDING JUNE 30, 1922.

DISBURSEMENTS.

	Hatch Fund	Adams Fund	Animal Husbandry Investigations
Salaries	$6503.78	$13933.87	--------
Labor	2331.08	349.00	$2412.55
Publications	50.78	--------	16.08
Postage and Stationery	628.19	58.35	57.18
Freight and Express	234.04	21.15	164.19
Heat, light, water and power	706.63	33.76	125.51
Chemical and laboratory supplies	34.75	--------	--------
Seeds, plants and sundry supplies	893.98	16.85	338.59
Fertilizers	--------	--------	--------
Feeding Stuffs	2191.55	137.22	3027.31
Library	438.45	37.91	7.32
Tools, machinery and appliances	236.62	--------	--------
Furniture and fixtures	34.34	--------	7.48
Scientific apparatus and specimens	70.92	398.62	--------
Live stock	--------	--------	26.26
Traveling expenses	279.43	103.27	35.96
Contingent expenses	--------	--------	278.00
Buildings and land	366.36	--------	10.53
Total	$15000.00	$15000.00	$6506.96*

*$1506.96 from sales funds.

REPORT OF THE TREASURER FOR YEAR ENDING JUNE 30, 1922.

DISBURSEMENTS.

	Aroostook Farm	Highmoor Farm	General Account	Inspection Analysis
Salaries	$1165.00	$1558.37	--------	$11416.57
Labor	3909.15	3854.44	$15.59	--------
Publications	--------	--------	--------	--------
Postage and Stationery	34.00	66.12	.90	24.63
Freight and express	56.62	221.60	2.24	98.64
Heat, light, water and power	104.36	868.09	21.35	191.00
Chemical and laboratory supplies	65.25	--------	--------	187.77
Seeds, plants and sundry supplies	522.44	1889.19	53.69	23.88
Fertilizers	1230.00	392.44	--------	--------
Feeding stuffs	604.28	654.02	3.48	--------
Library	--------	--------	--------	--------
Tools, machinery and appliances	282.75	941.03	146.42	--------
Furniture and fixtures	79.93	88.54	--------	--------
Scientific apparatus and specimens	--------	60.00	--------	62.06
Live stock	--------	--------	--------	--------
Traveling expenses	4.02	54.34	26.96	18.93
Contingent expenses	62.35	13.00	33.74	5.00
Buildings and land	150.98	171.64	47.75	--------
Total	$8271.13*	$10832.82†	$352.12	$12028.48

*$3271.13 from sales funds.
†$5832.82 from sales funds.

INDEX

THIRTY-EIGHTH ANNUAL REPORT

OF THE

Maine Agricultural Experiment Station

ORONO, MAINE

1922

UNIVERSITY OF MAINE

1922

MAINE
AGRICULTURAL EXPERIMENT STATION
ORONO, MAINE

ORGANIZATION JANUARY TO JUNE, 1922

THE STATION COUNCIL

PRESIDENT CLARENCE C. LITTLE,	*President**
DIRECTOR WARNER J. MORSE,	*Secretary*
ORA GILPATRICK, Houlton,	*Committee of Board of Trustees*
THOMAS E. HOUGHTON, Fort Fairfield,	*Committee of Board of Trustees*
FRANK E. GUERNSEY, Dover,	*Committee of Board of Trustees*
FRANK P. WASHBURN, Augusta,	*Commissioner of Agriculture*
EUGENE H. LIBBY, Auburn,	*State Grange*
WILSON H. CONANT, Buckfield,	*State Pomological Society*
JOHN W. LELAND, Dover,	*State Dairymen's Association*
LEONARD C. HOLSTON, Cornish,	*Maine Livestock Breeders' Ass'n.*
WILLIAM G. HUNTON, Portland,	*Maine Seed Improvement Ass'n.*

AND THE HEADS AND ASSOCIATES OF STATION DEPARTMENTS, AND THE DEAN OF THE COLLEGE OF AGRICULTURE

THE STATION STAFF

ADMINISTRATION	WARNER J. MORSE, PH. D.,	*Director*
	ESTELLE M. GOGGIN,	*Clerk*
	CHARLES C. INMAN,	*Clerk*
	MARY L. NORTON,	*Clerk*
BIOLOGY	JOHN W. GOWEN, PH. D.,	*Biologist*
	KARL SAX, SC. D.,	*Biologist*
	MARJORIE GOOCH, B. S.,	*Assistant*
	MILDRED R. COVELL,	*Clerk*
	BEATRICE GOODINE,	*Laboratory Assistant*
CHEMISTRY	JAMES M. BARTLETT, M. S.,	*Chemist*
	ELMER R. TOBEY, CH. E.,	*Associate*
	C. HARRY WHITE, PH. C.,	*Assistant*
ENTOMOLOGY	EDITH M. PATCH, PH. D.,	*Entomologist*
	ALICE W. AVERILL,	*Laboratory Assistant*
PLANT PATHOLOGY	WARNER J. MORSE, PH. D.,	*Pathologist*
	DONALD FOLSOM, PH. D.,	*Associate*
	VIOLA L. MORRIS,	*Laboratory Assistant*
AROOSTOOK FARM	.....	*Associate Biologist*
	PERLEY H. DOWNING,	*Superintendent*
HIGHMOOR FARM	WELLINGTON SINCLAIR,	*Superintendent*
	.....	*Scientific Aid*

*From April 12

MAINE

AGRICULTURAL EXPERIMENT STATION

ORONO, MAINE

ORGANIZATION JULY TO DECEMBER, 1922

THE STATION COUNCIL

PRESIDENT CLARENCE C. LITTLE,	*President*
DIRECTOR WARNER J. MORSE,	*Secretary*
ORA GILPATRICK, Houlton,	*Committee of Board of Trustees*
THOMAS E. HOUGHTON, Fort Fairfield,	
FRANK E. GUERNSEY, Dover,	
FRANK P. WASHBURN, Augusta,	*Commissioner of Agriculture*
EUGENE H. LIBBY, Auburn,	*State Grange*
WILSON H. CONANT, Buckfield,	*State Pomological Society*
JOHN W. LELAND, Dover,	*State Dairymen's Association*
LEONARD C. HOLSTON, Yarmouth,	*Maine Livestock Breeders' Ass'n.*
WILLIAM G. HUNTON, Portland,	*Maine Seed Improvement Ass'n.*

AND THE HEADS AND ASSOCIATES OF STATION DEPARTMENTS, AND THE DEAN OF THE COLLEGE OF AGRICULTURE

THE STATION STAFF

ADMINISTRATION	WARNER J. MORSE, PH. D.,	*Director*
	CHARLES C. INMAN,	*Clerk*
	MARY L. NORTON,	*Clerk*
	ILA K. WHITE,	*Clerk*
BIOLOGY	JOHN W. GOWEN, PH. D.,	*Biologist*
	KARL SAX, SC. D.,	*Biologist*
	MARJORIE GOOCH, M. S.,	*Assistant*
	MILDRED R. COVELL,	*Clerk*
	BEATRICE WEBSTER,	*Laboratory Assistant*
CHEMISTRY	JAMES M. BARTLETT, M. S.,	*Chemist*
	ELMER R. TOBEY, CH. E.,	*Associate*
	C. HARRY WHITE, PH. C.,	*Assistant*
ENTOMOLOGY	EDITH M. PATCH, PH. D.,	*Entomologist*
	ALICE W. AVERILL,	*Laboratory Assistant*
PLANT PATHOLOGY	WARNER J. MORSE, PH. D.,	*Pathologist*
	DONALD FOLSOM, PH. D.,	*Associate*
	VIOLA L. MORRIS,	*Laboratory Assistant*
AROOSTOOK FARM	.....	*Associate Biologist*
	PERLEY H. DOWNING,	*Superintendent*
HIGHMOOR FARM	.....	*Scientific Aid*
	WELLINGTON SINCLAIR,	*Superintendent*

The publications of this Station will be sent free to any address in Maine. All requests should be sent to

Agricultural Experiment Station,
Orono, Maine.

CONTENTS

ANNOUNCEMENTS.

Establishment of the Station

The Maine Fertilizer Control and Agricultural Experiment Station, established by Act of the Legislature approved March 3, 1885, began its work in April of that year in quarters furnished by the College. After the Station had existed for two years, Congress passed what is known as the Hatch Act, establishing agricultural experiment stations in every state. This grant was accepted by the Maine Legislature by an Act approved March 16, 1887, which established the Maine Agricultural Experiment Station as a department of the University. The reorganization was effected in June, 1887, but work was not begun until February 16, 1888. In 1906, Congress passed the Adams Act for the further endowment of the stations established under the Hatch Act.

The purpose of the experiment stations is defined in the Act of Congress establishing them as follows:

"It shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantage of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manure, natural and artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective states or territories."

The work that the Experiment Station can undertake from the Adams Act fund is more restricted and can "be applied

only to paying the necessary expenses for conducting original researches or experiments bearing directly on the agricultural industry of the United States, having due regard to the varying conditions and needs of the respective states and territories."

Investigations.

The Station continues to restrict its work to a few important lines, believing that it is better for the agriculture of the State to study thoroughly a few problems than to spread over the whole field of agricultural science. It has continued to improve its facilities and segregate its work in such a way as to make it an effective agency for research in agriculture. Prominent among the lines of investigation are studies upon the food of man and animals, the diseases of plants and animals, breeding of plants and animals, orchard and field experiments, poultry investigations, and entomological research.

Inspections.

Up to the close of the year 1913, it had been the duty of the Director of the Station to execute the laws regulating the sale of agricultural seeds, apples, commercial feeding stuffs, commercial fertilizers, drugs, foods, fungicides and insecticides, and the testing of the graduated glassware used by creameries. Beginning with January, 1914, the purely executive part of these laws is handled by the Commissioner of Agriculture. It is still the duty of the Director of the Station to make the analytical examination of the samples collected by the Commissioner and to publish the results of the analyses. The cost of the inspections is borne by fees and by a State appropriation.

Offices and Laboratories.

The offices, laboratories and poultry plant of the Maine Agricultural Experiment Station are at the University of Maine, Orono. Orono is the freight, express, post, telegraph and telephone address for the offices and laboratories.

AROOSTOOK FARM.

By action of the Legislatures of 1913 and 1915 a farm was purchased in Aroostook County for scientific investigations in agriculture to be under "the general supervision, management, and control" of the Maine Agricultural Experiment Station. The farm is in the town of Presque Isle, about 2 miles south of the village, on the main road to Houlton. The Bangor and Aroostook railroad crosses the farm.

The farm contains about 275 acres, about half of which is cleared. The eight room house provides an office, and home for the farm superintendent. A school house on a lot adjoining the farm was presented to the State by the town of Presque Isle and after being remodeled serves as a boarding house for the help. A greenhouse and a potato storage house have been erected at the farm by the U. S. Department of Agriculture for use in cooperative work on potato breeding. The large barn affords storage for hay and grain and has a large potato storage house in the basement.

HIGHMOOR FARM.

The State Legislature of 1909 purchased a farm upon which the Maine Agricultural Experiment Station was directed to "conduct scientific investigations in orcharding, corn and other farm crops." The farm is situated largely in the town of Monmouth. It is on the Farmington Branch of the Maine Central Railroad, 2 miles from Leeds Junction. A flag station, "Highmoor," is on the farm.

The farm contains 225 acres, about 200 of which are in orchards, fields, and pastures. There are in the neighborhood of 3,000 apple trees upon the place which have been set from 20 to 30 years. The house has 2 stories with a large wing, and contains about 15 rooms. It is well arranged for the Station offices and for the home of the farm superintendent. A substantially constructed building for apple packing was erected in 1912.

The removal of the crossbred herd from the University to Highmoor necessitated considerable change in the barns and the building of a new one 80 x 36 to accommodate the herd. This barn has a basement for manure, the cow stanchions above, and a loft for storage of hay.

PUBLICATIONS.

The Station is organized so that the work of investigation is distinct from the work of inspection. The results of investigation are published in the bulletins of the Station and in scientific journals, both foreign and domestic. The bulletins for the year make up the annual report. The results of the work of inspection are printed in publications known as Official Inspections. These are paged independently of the bulletins and are bound in with the annual report as an appendix thereto. Miscellaneous publications consisting of newspaper notices of bulletins, newspaper bulletins and circulars which are not paged consecutively and for the most part are not included in the annual report are issued during the year.

BULLETINS ISSUED IN 1922.

No. 305. The Relation of Tree Type to Productivity in the Apple. 20 pages. 4 pages of plates.
No. 306. Studies in Milk Secretion. XVII. Relation between Milk Yields and Butter-Fat Percentages of the 7-day and 365-day Tests of Holstein-Friesian Advanced Registry Cattle. 40 pages.
No. 307. Sterility Relationships in Maine Apple Varieties. 16 pages.
No. 308. The Blueberry Maggot in Washington County. 16 pages. 1 page of plates.
No. 309. Abstracts of Papers not Included in Bulletins, Finances, Meteorology, Index. pages.

OFFICIAL INSPECTIONS ISSUED IN 1922.

No. 103. Foods and Drugs. 24 pages.
No. 104. Commercial Feeding Stuffs, 1921-22. 20 pages.
No. 105. Commercial Fertilizers, 1922. 32 pages.
No. 106. Commercial Agricultural Seeds, 1922. Insecticides and Fungicides, 1922. 24 pages.

PUBLICATIONS FROM THE BIOLOGICAL LABORATORY IN 1922.

Sterility in Wheat Hybrids. II. Chromosome Behavior in Partially Sterile Hybrids. By Karl Sax. Genetics, Vol. 7, pp. 513-552, November, 1922.
Sterility in Wheat Hybrids. III. Endosperm Development and F_2 Sterility. By Karl Sax. Genetics, Vol. 7, pp. 553-558, November, 1922.

PUBLICATIONS FROM THE ENTOMOLOGICAL LABORATORY IN 1922.

Aroostook Potato Insects. By Edith M. Patch, Journal of Economic Entomology, Vol. 15, p. 373. October, 1922.

STATION NOTES

COUNCIL AND STAFF CHANGES

At the annual spring meeting of the Station Council on April 12, 1922, Dr. Clarence C. Little, President of the University, was elected president of the Council to succeed Dr. Robert J. Aley, resigned.

Mr. E. Raymond Ring, Superintendent of Aroostook Farm for three years and for one year Scientific Aid in connection with the plant breeding work at the Farm resigned on April 1 to accept a similar position with the Rockefeller Institute for Medical Research at Princeton, N. J. In temperament, training and experience Mr. Ring possessed exceptional qualifications for a position of this kind and his resignation was a distinct loss to the Station. Mr. Perley H. Downing was appointed to succeed him.

Mrs. Estelle M. Goggin resigned as Clerk in the Station office on July 1 and Miss Ila K. White was appointed to a similar position on that date. Mrs. Beatrice G. Webster resigned as Laboratory Assistant in Biology on December 1.